

I claim:

1. An electrode assembly for an electrochemical cell, comprising:
- (a) an anode assembly comprising an elongated strip of alkali metal forming an anode and an anode current collector having at least a first connector tab disposed on a first edge thereof, the strip of elongated alkali metal having a first length and a first height, the anode current collector having a second length and a second height;
  - (b) a cathode assembly, comprising:
    - (1) a cathode current collector having disposed on a second edge thereof at least a second connector tab, the cathode current collector having a third length and a third height; and
    - (2) a cathode material bonded to the current collector,
- the anode and cathode assemblies forming a unidirectional electrode winding having two substantially straight sides, the assemblies having interposed therebetween at least one separator, the <sup>second</sup> first length of the anode current collector being shorter than the <sup>first</sup> second length of the elongated strip of alkali metal.
2. The electrode assembly of claim 1 wherein the <sup>second</sup> first length is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the <sup>first</sup> second length.
3. The electrode assembly of claim 1, wherein the anode current collector is formed from a material selected from the group consisting of titanium, nickel, copper and alloys thereof.
4. The electrode assembly of claim 1, wherein the cathode current collector is formed

of titanium.

5. The electrode assembly of claim 1, wherein the cathode material comprises a solid reactive material, a binder material and a conductivity enhancer.

6. The electrode assembly of claim <sup>5</sup>~~1~~<sub>h</sub>, wherein the solid reactive material is silver vanadium oxide.

7. The electrode assembly of claim <sup>5</sup>~~1~~<sub>h</sub>, wherein the binder material is PTFE.

8. The electrode assembly of claim <sup>5</sup>~~1~~<sub>h</sub>, wherein the conductivity enhancer is conductive carbon.

9. The electrode assembly of claim 1, wherein the separator covers the anode assembly and provides a seal therearound, the pouch having an opening through which the at least first connector tab projects.

10. An electrode assembly for an electrochemical cell, comprising:

(a) an anode assembly comprising an elongated strip of alkali metal forming an anode and an anode current collector having at least a first connector tab disposed on a first edge thereof, the strip of elongated alkali metal having a first length and a first height, the anode current collector having a second length and a second height;

(b) a cathode assembly, comprising:

- (1) a cathode current collector having disposed on a second edge thereof at least a second connector tab, the cathode current collector having a third length and a third height; and
- (2) a cathode material bonded to the current collector,

*Ben* the anode and cathode assemblies forming a unidirectional electrode winding having two substantially straight sides, the assemblies having interposed therebetween at least one separator, the <sup>second</sup> ~~first~~ height of the anode current collector being shorter than the <sup>first</sup> ~~second~~ height of the elongated strip of alkali metal.

*SUB F1* 11. The electrode assembly of claim 10, wherein the <sup>second height</sup> ~~first length~~ is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the <sup>first height</sup> ~~second length~~.

12. The electrode assembly of claim 10, wherein the anode current collector is formed from a material selected from the group consisting of titanium, nickel, copper and alloys thereof.

13. The electrode assembly of claim 10, wherein the cathode current collector is formed of titanium.

14. The electrode assembly of claim 10, wherein the cathode material comprises a solid reactive material, a binder material and a conductivity enhancer.

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15. The electrode assembly of claim <sup>14</sup> ~~10~~, wherein the solid reactive material is silver vanadium oxide.

<sup>14</sup>  
16. The electrode assembly of claim <sup>14</sup> ~~10~~, wherein the binder material is PTFE.

<sup>14</sup>  
17. The electrode assembly of claim <sup>14</sup> ~~10~~, wherein the conductivity enhancer is conductive carbon.

18. The electrode assembly of claim 10, wherein the separator covers the anode assembly and provides a seal therearound, the pouch having an opening through which the at least first connector/tab projects.

19. An electrode assembly for an electrochemical cell, comprising:

(a) an anode assembly comprising an elongated strip of alkali metal forming an anode and an anode current collector having at least a first connector tab disposed on a first edge thereof, the strip of elongated alkali metal having a first length and a first height, the anode current collector having a second length and a second height;

(b) a cathode assembly, comprising:

(1) a cathode current collector having disposed on a second edge thereof at least a second connector tab, the cathode current collector having a third length and a third height; and

(2) a cathode material bonded to the current collector,

the anode and cathode assemblies forming a unidirectional electrode winding having two substantially straight sides, the assemblies having interposed therebetween at least one separator, the <sup>second</sup> ~~first~~ length of the anode current collector being shorter than the third length of the cathode current collector.

20. The electrode assembly of claim 19, wherein the <sup>second</sup> ~~first~~ length is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the third length.

21. The electrode assembly of claim 19, wherein the anode current collector is formed from a material selected from the group consisting of titanium, nickel, copper and alloys thereof.

22. The electrode assembly of claim 19, wherein the cathode current collector is formed of titanium.

23. The electrode assembly of claim 19, wherein the cathode material comprises a solid reactive material, a binder material and a conductivity enhancer.

24. The electrode assembly of claim 19, wherein the solid reactive material is silver vanadium oxide.

25. The electrode assembly of claim 19, wherein the binder material is PTFE.

26. The electrode assembly of claim 19, wherein the conductivity enhancer is conductive carbon.

27. The electrode assembly of claim 19, wherein the separator covers the anode assembly and provides a seal therearound, the pouch having an opening through which the at least first connector tab projects.

28. An electrode assembly for an electrochemical cell, comprising:

(a) an anode assembly comprising an elongated strip of alkali metal forming an anode and an anode current collector having at least a first connector tab disposed on a first edge thereof, the strip of elongated alkali metal having a first length and a first height, the anode current collector having a second length and a second height,

(b) a cathode assembly, comprising:

(1) a cathode current collector having disposed on a second edge thereof at least a second connector tab, the cathode current collector

having a third length and a third height; and

(2) a cathode material bonded to the current collector, the anode and cathode assemblies forming a unidirectional electrode winding having two substantially straight sides, the assemblies having interposed therebetween at least one separator, the <sup>second</sup> ~~first~~ height of the anode current collector being shorter than the third height of the cathode current collector.

SUB 1/2 29. The electrode assembly of claim 28, wherein the <sup>second</sup> ~~first~~ height is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the third height.

30. The electrode assembly of claim 28, wherein the anode current collector is formed from a material selected from the group consisting of titanium, nickel, copper and alloys thereof.

31. The electrode assembly of claim 28, wherein the cathode current collector is formed of titanium.

32. The electrode assembly of claim 28, wherein the cathode material comprises a solid reactive material, a binder material and a conductivity enhancer.

32 33. The electrode assembly of claim 28, wherein the solid reactive material is silver vanadium oxide.

32 34. The electrode assembly of claim 28, wherein the binder material is PTFE.

32 35. The electrode assembly of claim 28, wherein the conductivity enhancer is

conductive carbon.

36. The electrode assembly of claim 28, wherein the separator covers the anode assembly and provides a seal therearound, the pouch having an opening through which the at least first connector tab projects.

37. An electrode assembly for an electrochemical cell, comprising:

(a) an anode assembly comprising an elongated strip of alkali metal forming an anode and an anode current collector having at least a first connector tab disposed on a first edge thereof, the strip of elongated alkali metal having a first length and a first height, the anode current collector having a second length and a second height;

(b) a cathode assembly, comprising:

(1) a cathode current collector having disposed on a second edge thereof at least a second connector tab, the cathode current collector having a third length and a third height; and

(2) a cathode material bonded to the current collector,

the anode and cathode assemblies forming a unidirectional electrode winding having two substantially straight sides, the assemblies having interposed therebetween at least one separator, the <sup>second</sup> first length of the anode current collector being shorter than the <sup>first</sup> second length of the elongated strip of alkali metal, the <sup>second</sup> first height of the anode current collector being shorter than the <sup>first</sup> second height of the elongated strip of alkali metal.

38. The electrode assembly of claim 37, wherein the <sup>second</sup> first height is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the <sup>first</sup> second height.

39. The electrode assembly of claim 37, wherein the anode current collector is formed from a material selected from the group consisting of titanium, nickel, copper and alloys thereof.

40. The electrode assembly of claim 37, wherein the cathode current collector is formed of titanium.

41. The electrode assembly of claim 37, wherein the cathode material comprises a solid reactive material, a binder material and a conductivity enhancer.

42. The electrode assembly of claim 37, wherein the solid reactive material is silver vanadium oxide.

43. The electrode assembly of claim 37, wherein the binder material is PTFE.

44. The electrode assembly of claim 37, wherein the conductivity enhancer is conductive carbon.

45. The electrode assembly of claim 37, wherein the separator covers the anode assembly and provides a seal therearound, the pouch having an opening through which the at least first connector tab projects.

46. An electrode assembly for an electrochemical cell, comprising:

- (a) an anode assembly comprising an elongated strip of alkali metal forming an anode and an anode current collector having at least a first connector tab disposed on a first edge thereof, the strip of elongated alkali metal having a first length and a first height, the anode current collector having a second

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length and a second height;

(b) a cathode assembly, comprising:

- (1) a cathode current collector having disposed on a second edge thereof at least a second connector tab, the cathode current collector having a third length and a third height; and
- (2) a cathode material bonded to the current collector,

the anode and cathode assemblies forming a unidirectional electrode winding having two substantially straight sides, the assemblies having interposed therebetween at least one separator, the <sup>second</sup> ~~first~~ length of the anode current collector being shorter than the <sup>first</sup> ~~second~~ length of the elongated strip of alkali metal, the <sup>second</sup> ~~first~~ length of the anode current collector being shorter than the third length of the cathode current collector.

47. The electrode assembly of claim 46, wherein the <sup>second</sup> ~~first~~ length is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the third length.

48. The electrode assembly of claim 46, wherein the anode current collector is formed from a material selected from the group consisting of titanium, nickel, copper and alloys thereof.

49. The electrode assembly of claim 46, wherein the cathode current collector is formed of titanium.

50. The electrode assembly of claim 46, wherein the cathode material comprises a solid reactive material, a binder material and a conductivity enhancer.

51. The electrode assembly of claim 46, wherein the solid reactive material is silver vanadium oxide.

52. The electrode assembly of claim 46, wherein the binder material is PTFE.

53. The electrode assembly of claim 46, wherein the conductivity enhancer is conductive carbon.

54. The electrode assembly of claim 46, wherein the separator covers the anode assembly and provides a seal therearound, the pouch having an opening through which the at least first connector tab projects.

55. An electrode assembly for an electrochemical cell, comprising:

- (a) an anode assembly comprising an elongated strip of alkali metal forming an anode and an anode current collector having at least a first connector tab disposed on a first edge thereof, the strip of elongated alkali metal having a first length and a first height, the anode current collector having a second length and a second height;
- (b) a cathode assembly, comprising:

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- (1) a cathode current collector having disposed on a second edge thereof at least a second connector tab, the cathode current collector having a third length and a third height; and
  - (2) a cathode material bonded to the current collector,

the anode and cathode assemblies forming a unidirectional electrode winding having two substantially straight sides, the assemblies having interposed therebetween at least one separator, the first length of the anode current collector being shorter than the second length of the elongated strip of alkali metal, the first

height of the anode current collector being shorter than the third height of the cathode current collector.

56. The electrode assembly of claim 55, wherein the <sup>second</sup> ~~first~~ length is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the <sup>first</sup> ~~second~~ length.

57. The electrode assembly of claim 55, wherein the anode current collector is formed from a material selected from the group consisting of titanium, nickel, copper and alloys thereof.

58. The electrode assembly of claim 55, wherein the cathode current collector is formed of titanium.

59. The electrode assembly of claim 55, wherein the cathode material comprises a solid reactive material, a binder material and a conductivity enhancer.

60. The electrode assembly of claim <sup>59</sup> ~~58~~, wherein the solid reactive material is silver vanadium oxide.

61. The electrode assembly of claim <sup>59</sup> ~~58~~, wherein the binder material is PTFE.

62. The electrode assembly of claim 55, wherein the first height is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the third height.

63. The electrode assembly of claim 55, wherein the separator covers the anode assembly and provides a seal therearound, the pouch having an opening through which the at least first connector tab projects.

64. An electrode assembly for an electrochemical cell, comprising:

(a) an anode assembly comprising an elongated strip of alkali metal forming an anode and an anode current collector having at least a first connector tab disposed on a first edge thereof, the strip of elongated alkali metal having a first length and a first height, the anode current collector having a second length and a second height;

(b) a cathode assembly, comprising:

(1) a cathode current collector having disposed on a second edge thereof at least a second connector tab, the cathode current collector having a third length and a third height; and

(2) a cathode material bonded to the current collector,

the anode and cathode assemblies forming a unidirectional electrode winding having two substantially straight sides, the assemblies having interposed

therebetween at least one separator, the <sup>second</sup> first height of the anode current collector being shorter than the <sup>first</sup> second height of the elongated strip of alkali metal, the <sup>second</sup> first length of the anode current collector being shorter than the third length of the cathode current collector.

65. The electrode assembly of claim 64, wherein the <sup>second</sup> first length is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the third length.

66. The electrode assembly of claim 64, wherein the anode current collector is formed

from a material selected from the group consisting of titanium, nickel, copper and alloys thereof.

67. The electrode assembly of claim 64, wherein the cathode current collector is formed of titanium.

68. The electrode assembly of claim 64, wherein the cathode material comprises a solid reactive material, a binder material and a conductivity enhancer.

69. The electrode assembly of claim <sup>68</sup>64, wherein the solid reactive material is silver vanadium oxide.

70. The electrode assembly of claim 64, wherein the <sup>second</sup>first height is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the <sup>first</sup>second height.

71. The electrode assembly of claim 64, wherein the conductivity enhancer is conductive carbon.

72. The electrode assembly of claim 64, wherein the separator covers the anode assembly and provides a seal therearound, the pouch having an opening through which the at least first connector tab projects.

73. An electrode assembly for an electrochemical cell, comprising:

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- (a) an anode assembly comprising an elongated strip of alkali metal forming an anode and an anode current collector having at least a first connector tab disposed on a first edge thereof, the strip of elongated alkali metal having a

first length and a first height, the anode current collector having a second length and a second height;

(b) a cathode assembly, comprising:

(1) a cathode current collector having disposed on a second edge thereof at least a second connector tab, the cathode current collector having a third length and a third height; and

(2) a cathode material bonded to the current collector,

the anode and cathode assemblies forming a unidirectional electrode winding having two substantially straight sides, the assemblies having interposed

therebetween at least one separator, the <sup>second</sup> first height of the anode current collector being shorter than the <sup>first</sup> second height of the elongated strip of alkali metal, the <sup>second</sup> first length of the anode current collector being shorter than the third length of the

cathode current collector, the first height of the anode current collector being shorter than the third height of the cathode current collector.

74. The electrode assembly of claim 73, wherein the first length is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the third length.

75. The electrode assembly of claim 73, wherein the anode current collector is formed from a material selected from the group consisting of titanium, nickel, copper and alloys thereof.

76. The electrode assembly of claim 73, wherein the cathode current collector is formed of titanium.

77. The electrode assembly of claim 73, wherein the cathode material comprises a

solid reactive material, a binder material and a conductivity enhancer.

78. The electrode assembly of claim <sup>77</sup>73, wherein the solid reactive material is silver vanadium oxide. <sup>A</sup>

79. The electrode assembly of claim 73, wherein the <sup>second</sup> ~~first~~ height is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10% or about 5% shorter than the third height.

80. The electrode assembly of claim <sup>77</sup>73, wherein the conductivity enhancer is conductive carbon. <sup>A</sup>

81. The electrode assembly of claim <sup>77</sup>73, wherein the separator covers the anode assembly and provides a seal therearound, the pouch having an opening through which the at least first connector tab projects.

82. An electrode assembly for an electrochemical cell, comprising:

(a) an anode assembly comprising an elongated strip of alkali metal forming an anode and an anode current collector having at least a first connector tab disposed on a first edge thereof, the strip of elongated alkali metal having a first length and a first height, the anode current collector having a second length and a second height;

(b) a cathode assembly, comprising:

(1) a cathode current collector having disposed on a second edge thereof at least a second connector tab, the cathode current collector having a third length and a third height; and

(2) a cathode material bonded to the current collector,

the anode and cathode assemblies forming a unidirectional electrode winding

having two substantially straight sides, the assemblies having interposed therebetween at least one separator, the <sup>second</sup> first length of the anode current collector being shorter than the third length of the cathode current collector, the first height of the anode current collector being shorter than the third height of the cathode current collector.

83. The electrode assembly of claim 82, wherein the <sup>second</sup> first length is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the third length.

84. The electrode assembly of claim 82, wherein the anode current collector is formed from a material selected from the group consisting of titanium, nickel, copper and alloys thereof.

85. The electrode assembly of claim 82, wherein the cathode current collector is formed of titanium.

86. The electrode assembly of claim 82, wherein the cathode material comprises a solid reactive material, a binder material and a conductivity enhancer.

87. The electrode assembly of claim <sup>86</sup>82, wherein the solid reactive material is silver vanadium oxide.

88. The electrode assembly of claim 82, wherein the <sup>second</sup> first height is about 90%, about 80%, about 70%, about 60%, about 50%, about 40%, about 30%, about 20%, about 15%, about 10%, or about 5% shorter than the third height.



89. The electrode assembly of claim 82, wherein the conductivity enhancer is conductive carbon.

90. The electrode assembly of claim 82, wherein the separator covers the anode assembly and provides a seal therearound, the pouch having an opening through which the at least first connector tab projects.

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